the reACT$_2$ant

On the web at http://www.statweb.org/act2

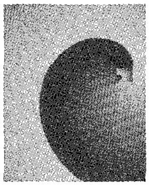
Volume 10 Number 3 Summer 2003

The Newsletter of the Associated Chemistry Teachers of Texas

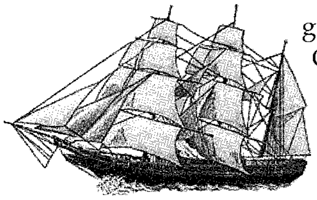
Chemistry By the Sea

by Rosendo García

There is STILL time to register for the Biennial Conference. You can register on-line or by mail and the cost is now $125. The registration forms are at the back of this issue. On-site registration will also be possible, but to ensure we have enough dorm rooms and food, please try to register beforehand. It's the best chemistry bargain around! Register on-line at the ACT$_2$ web site at *www.statweb.org/act2.*



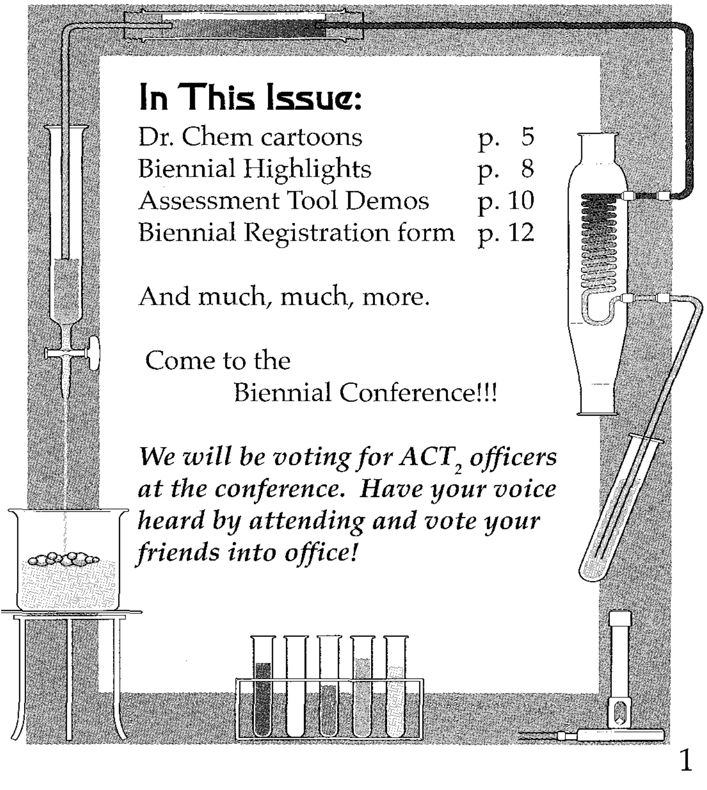
It all starts on Tuesday evening, July 8 with an informal get together and buffet. The workshops begin on Wednesday with great presentations from **you** and fellow teachers, college professors, and industry professionals. A co-discoverer of Mendelevium, Dr. Gregg Choppin, will present two great sessions. A former high school teacher and now a college professor, George McKelvy will present sessions on using the web to teach chemistry. Chemistry and Magic will come together under the direction of Jeff Hepburn. A cd-rom of all workshop materials is in development so we can all have all the handouts from all the sessions. *(The cd-rom depends on presenters sending in their handouts electronically. Get that stuff sent in soon and we'll have a great cd.)*



We have planned some great field trips with a Galveston flair. The sailing ship *Elissa* is part of a tour of the harbor led by a marine biologist. An after hours tour of a drilling platform museum is also on schedule. See how they get the oil from the bottom of the gulf using these HUGE structures. A morning trip for some bird watching and water quality testing is also on tap. Water your imagination and travel the oceans of the world at the Moody Gardens Aquarium. Visit the MG Rainforest Pyramid for thousands of tropical plants, exotic fish, birds and butterflies or explore the mysteries of science at the MG Discovery Pyramid.

Now lets talk food! Meals are included with the dorm fee and we'll snack our way through the entire day. The dinner Thursday at the Fisherman's Wharf is going to be an event to remember. *Texas Monthly* calls it "one of the premier restaurants of the Texas gulf coast." We have a huge private dining room that looks out onto the port of Galveston. We will have a cash bar, music, and room to dance! *(And after a few trips to the cash bar we'll be ready to sing and dance.)*

If you are staying in the dorm you will need to bring a pillow, bed linens for a twin bed, a blanket, and towels. Bring workout clothes if you plan to use the treadmill and other equipment. Bring goggles and a lab apron too. Pack your suntan lotion, sun block, hat, swimsuit, comfortable shoes, and mosquito spray. Get set to have fun, visit with old friends, make new friends, and do some Chemistry. The festivities run from July 8 to July 12. The warm sea breeze and the Chemistry await you!



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And much, much, more.

Come to the
Biennial Conference!!!

We will be voting for ACT$_2$ officers at the conference. Have your voice heard by attending and vote your friends into office!

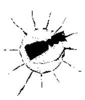
President's Corner

So long, farewell, auf Wiedersehen, good night... As I contemplate the end of my presidency this song from the "Sound of Music" keeps popping in my head. For my last official column I thought it appropriate to look back at the last couple of years. There are bright spots that stand out - the Biennial in Belton, the CAST luncheons, and the 'Chemistry Day" at CAST in El Paso - are a few. Then there are those items that we had to deal with like TEKS, TAKS, and a vision of what high school chemistry should be. We have had our differences in what that vision should entail. We have suffered the loss of one of our dearest and strongest members - the one who was instrumental in shaping the ACT_2 of today – in George Hague. We had the struggle of choosing the right textbook and then living with that choice. Overall it has been a wonderful growing experience for me. Thank you for entrusting the organization to me for the last few years.

Enough nostalgia! The Biennial in Galveston is next. You will want to me there or for the next two years you'll be explaining why you missed out. Roxie and her team have set up great program. The campus is small and we will have plenty of opportunities for bonding (networking). I will be doing a day of "Make and Take" stuff and a day of "Chemistry Thru Crafting." I know you will not want to miss the fun in Galveston!!!

Also, ChemEd is in Alabama and three of us are making the trip. We are still looking for a fourth in our carpool. If you're interested, let us know.

It is time to close the book on my term and to turn the reigns over to Roxie. I know she will do a terrific job. I know the members will give Roxie the same support given to me. Thanks for the ride - it has been a blast!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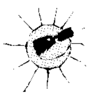
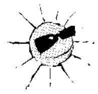

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Melissa Jones

Treasurer's Report

1/31/03 - 5/1/03
by Dale Moore

Opening Balance	$5958.58
Income	
Interest	$5.73
Member dues	$1540.00
Total Income	$1545.73
Expenses	
Printing	$15.40
Postage	$650.00
Total Expenses	$665.40
Ending Balance	**$6838.91**
Reserve Fund	**$6129.35**

Executive Board 2001 - 2003

Melissa Jones, President
2603 Bobwhite Lane
Georgetown, TX 78628-2301
(512) 863-9570 home
e-mail: mdjchem@yahoo.com

Roxie Allen, President-Elect
13415 Layton Castle
Cypress, TX 77429
(281) 225-6986 home
(713) 419-5118 cell
e-mail: rkvallen@yahoo.com

Bob Casao, Secretary/Webmaster
3144 McLean
El Paso, TX 79936
(915) 857-4400 ext 2317 work
(915) 591-5447 home
e-mail: rlcasao@elp.rr.com

Lisa McGaw, Past-President
AP Strategies
4311 Oak Lawn Ave, Suite 620
Dallas, TX 75219
(888) 949-9702 work
(903) 887-0625 home
e-mail: lmcgaw@apstrategies.org

Dale Moore, Treasurer
7204 Lighthouse Rd.
Arlington, TX 76002
(817) 472-5854 home
dmoore@academicplanet.com

Rosendo García, reACTant Editor
17401 Dashwood Creek Drive
Pflugerville, TX 78660
(512) 594-0800 work
(512) 594-0805 fax
(512) 989-3725 home
e-mail: rlgarcia@alumni.utexas.net

Jan Harris, Historian
5226 Wincroft Ct.
Houston, TX 77069
(281) 583-8213 home
(281) 583-4601 fax
e-mail: jaharris@unidial.com

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Regional Directors

Region II: Dr. J. J. Lagowski
Department of Chemistry
University of Texas
Austin, TX 78712
(512) 471-3288
e-mail: jjl@mail.utexas.edu

Region III: Dr. Robert G. Landolt
School of Science and Humaniites
Texas Wesleyan University
Ft. Worth, TX 76105
(817) 531-4893
e-mail: landoltr@startext.net

Region IV: pending

Region V: Prof. Mamie Moy
Department of Chemistry
University of Houston
Houston, TX 77204
(713) 743-2720
e-mail: mmoy@uh.edu

Region VI: Dr. John S. Thompson
Department of Chemistry
Texas A & M – Kingsville
Kingsville, TX 78363
(210) 595-2925
e-mail: kfjstoo@tamuk.edu

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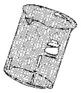
by Dr. Jim Marshall
University of
North Texas

Cobalt

In the 1400s an annoying mineral was found in the mines of Saxony and Bohemia. This mineral was difficult to remove during the smelting, and arsenic in it was unhealthy. This mineral was called "cobalt" from the German *Kobold* meaning subterranean gnome, which according to local myth caused miners mischief and endless trouble. By the 1500s it was realized that this mineral could produce beautiful blue glass. Georg Brandt prepared a blue pigment from an ore from Skilå in Riddarthytta, Sweden, and by 1735 he had prepared the metal. The similarity of iron, nickel, copper, and cobalt ores, and the confusing mix of their reduced metals and arsenic made it difficult to establish conclusively the elemental nature of cobalt until the late 1700s.



Cobalt, when alloyed with iron and nickel, produces Alnico, an alloy of high magnetic strength. Salts of cobalt have been used since historic times to produce the blue colors in porcelain and glass. The transition cobalt (II) chloride from pink to blue is used in invisible ink and in humidity indicators.

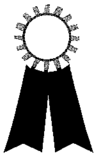
Cobalt
Co 27
[Ger. *Kobold*, goblin]
Ores known for centuries, metal isolated 1735
mp 1768 K; bp 3143 K; sp gr 8.9

Discovery of the Elements, by Dr. Jim Marshall of UNT

Stellar Members

by Rosendo García

Jeanne Allen-Beason will be spending the summer in the heart of Amish country in Lancaster, PA working for Johns Hopkins University. She will be teaching first year college chemistry (AP Chem) for their Center for Talented Youth program. There are twenty sites across the country and there were approximately 113, 000 applicants for the teaching positions. Jeanne heard about the program from one of our ACT$_2$ e-mail blast from Bob Casao and applied. (See those e-mails have great stuff. Read 'em all!) She got a form letter response telling about the large number of applicants. A few weeks later she was interviewed over the phone for an hour. Jeanne got a call soon after that informing her she had been selected.



Congratulations Jeanne!!

Dwan Garrison received the American Chemical Society Houston Region Thomas Aczel Award. The Aczel Award is presented for excellence in chemistry teaching. Dwan has taught Chemistry, Pre-AP Chemistry and AP Chemistry in the Houston area since 1989. She will be moving with her family to north Arkansas this summer where she will be teaching chemistry and physics at Flippin High School, Flippin, Arkansas.

Congratulations Dwan!!

Attend ChemEd 2003

The World's Best Chemistry Education Conference!

When: July 27 - 31, 2003

Where: Auburn University
Auburn, Alabama

If you love chemistry, you won't want to miss this extraordinary chemistry conference. The world's premier chemistry educators gather to present workshops, preform demonstrations, and share and exchange ideas. As one ChemEd participant put it, "I learned more about teaching chemistry in one week of ChemEd than in four years of college!"

Plus, you can bring your family for a whole week of tours and attractions only southern hospitality can provide! This is one conference that every high school chemistry teacher should attend!

Highlights include:
- More than 300 chemistry workshops (including numerous Flinn chemistry and safety workshops
- Master speakers
- Reg Freeson Keynote Lecture by Penney Sconzo
- Educational tours
- Vendor Exhibits (including Flinn Scientific!)

Registration and Additional Information:
- You can register and learn more about ChemEd 2003 at the ChemEd website at www.ChemEd.auburn.edu
- Be sure to attend a Flinn Scientific Workshop or visit us in the exhibit area!

We hope to see you there!

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From an anonymous
ACT$_2$ member

A Penny's Worth of Zinc

Background

In 1982 the U.S. Treasury began minting pennies composed of a zinc core covered with copper. In this experiment, you will remove the zinc from a penny by reacting the penny with hydrochloric acid:

$$Zn + 2HCl \rightarrow ZnCl_2 + H_2$$

You will determine the mass of copper and the mass of the zinc composing the coin. Finally, you will calculate the percent composition of zinc and copper in the penny, the number of moles of zinc and copper present in the penny, and the number of atoms of zinc and copper in the penny.

Procedure

Day One: *(Be sure to use a penny minted after 1982.)*

1. Label a 250mL beaker so it can be identified the later. Record the date on the penny.
2. Using a laboratory balance, determine the mass of the penny and record it in a data table. Record to 0.01 precision.
3. Use a triangular file to make three small notches on the edge of the penny. Spread the notches evenly apart. The notches should be deep enough to expose the zinc core. The zinc color will be evident.
4. Place the penny in the labeled 250mL beaker and add 25mL of 6*M* HCl.
5. Make observations about the reaction of HCl with zinc and HCl with copper. Record observations in the data table.
6. Place labeled beaker in the spot designated by your teacher. Allow the reaction to continue until the next lab period.

Day Two:

7. Use tongs to carefully remove the penny from the acid.
8. Pour the acid down the drain followed by plenty of water.
9. Rinse the beaker thoroughly with water and place the penny back in the beaker. Rinse the penny with fresh water several times to remove all traces of acid.
10. After rinsing carefully remove the penny and place it on a piece of paper towel and allow the penny to air dry for about 20 minutes.
11. When drying is complete, determine the mass of the copper shell. Record this mass in the data table.
12. For later comparison, record the date and mass of a pre-1982 penny.

Calculations

1. Determine the percent composition of both zinc and copper in your penny.
2. Determine the number of moles of copper and zinc in your penny.
3. Determine the number of atoms of copper and zinc in your penny.

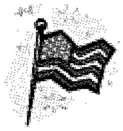
Lab Questions

1. List two pieces of evidence of a chemical reaction that were observed in this lab.
2. Using the following information, calculate the actual value of 100,000 post-1982 pennies and the value of 100,000 pre-1982 pennies.
   1 pound = 453.6 grams
   zinc = $0.59 per pound
   copper = $0.79 per pound
3. What is the advantage of putting a zinc core in a penny instead of making the penny solid copper?

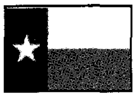
From Andy Sae

Patriotic Density Column

Show your patriotism using this demo of density and immiscibility. This colorful demonstration shows that some liquids don't mix and stay separated because of different densities.



Materials: aluminum foil; clear, narrow glass or clear plastic cup; blue lamp oil; light syrup (Karo) with red food color mixed in (5 drops of red food color per pint of syrup); milk or non-dairy coffee cream powder mixed with water.



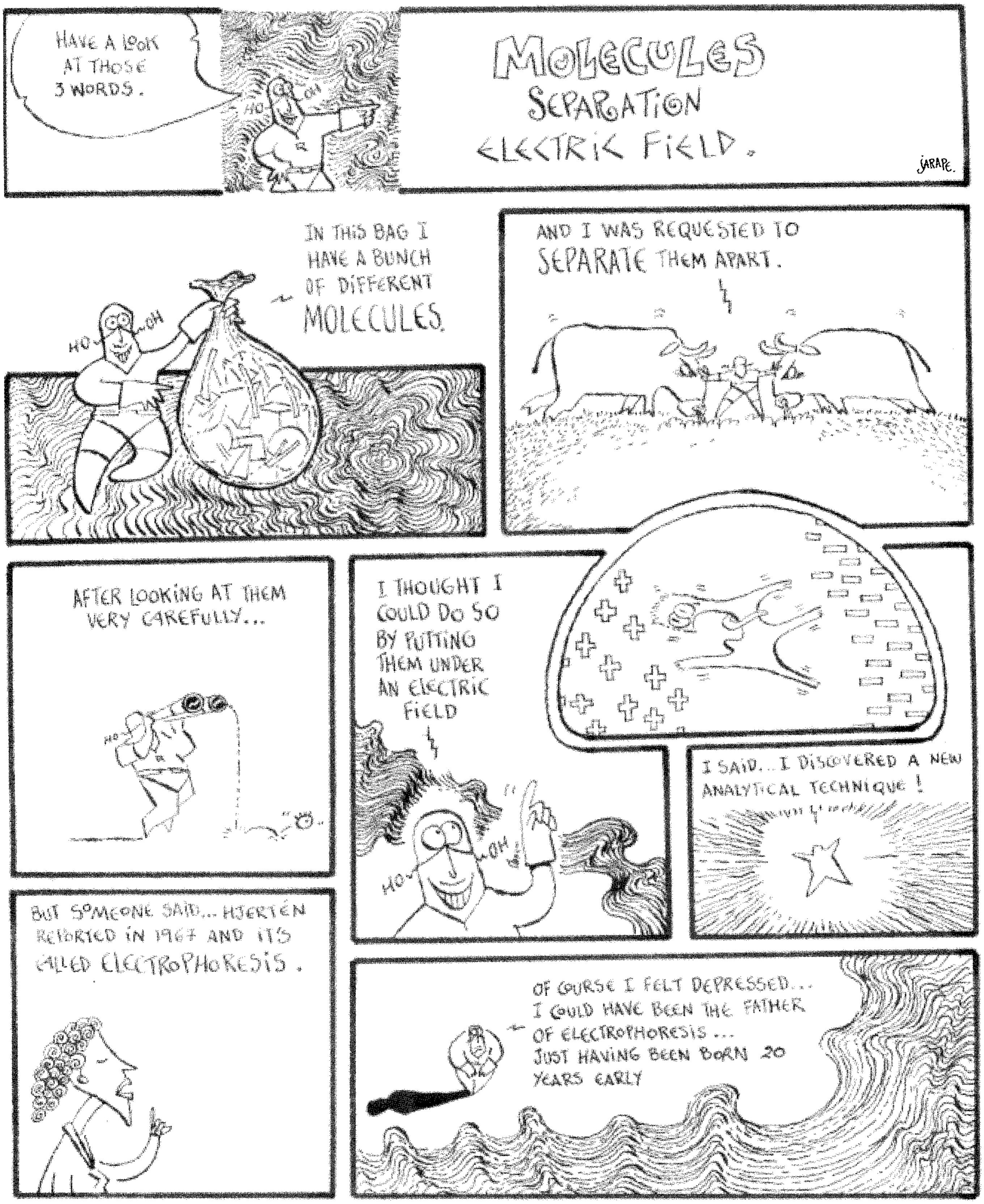
Procedure:

1. Cover the glass loosely with aluminum foil so that you can pour liquids into the class and can uncover the glass easily by lifting the foil off.
2. Pour the three liquids - lamp oil, milk, and red syrup - into the glass in any order. Pour slowly so that not too much mixing occurs.
3. Ask the students what color will result from mixing red, white, and blue. Then lift the aluminum foil to reveal three layers, with the red syrup on the bottom, white milk over the syrup, and blue lamp oil on top.

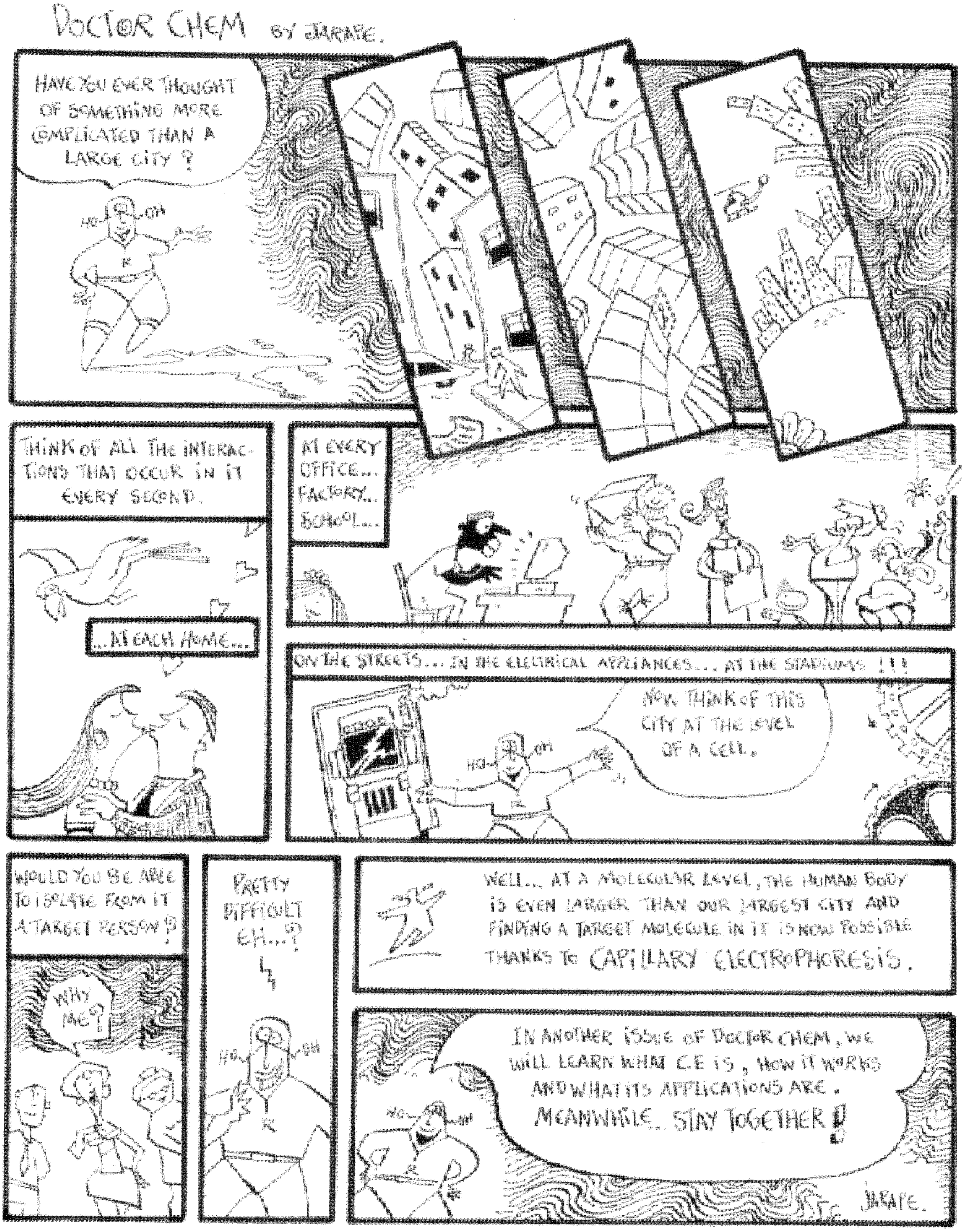
From *Chemical Magic From the Grocery Store* by Andy Sae

The Adventures of Dr. Chem

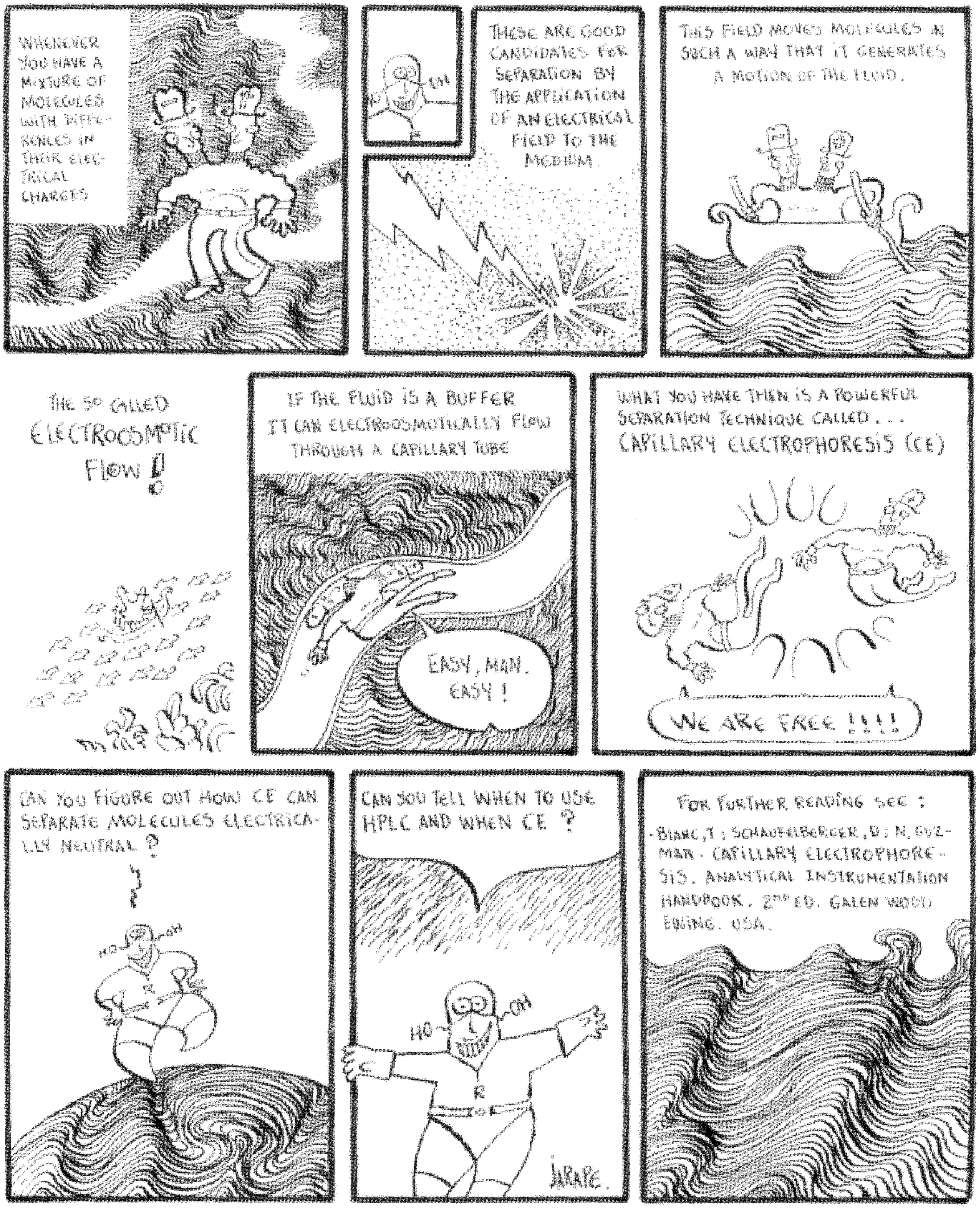
by Jarape
® ©


HAVE A LOOK AT THOSE 3 WORDS.
HO-OH
MOLECULES
SEPARATION
ELECTRIC FIELD.
JARAPE.
IN THIS BAG I HAVE A BUNCH OF DIFFERENT MOLECULES.
HO-OH
AND I WAS REQUESTED TO SEPARATE THEM APART.
AFTER LOOKING AT THEM VERY CAREFULLY...
HO-
I THOUGHT I COULD DO SO BY PUTTING THEM UNDER AN ELECTRIC FIELD
HO-OH
I SAID... I DISCOVERED A NEW ANALYTICAL TECHNIQUE!
BUT SOMEONE SAID... HJERTÉN REPORTED IN 1967 AND IT'S CALLED ELECTROPHORESIS.
OF COURSE I FELT DEPRESSED... I COULD HAVE BEEN THE FATHER OF ELECTROPHORESIS... JUST HAVING BEEN BORN 20 YEARS EARLY

More Adventures


DOCTOR CHEM BY JARAPE.
HAVE YOU EVER THOUGHT OF SOMETHING MORE COMPLICATED THAN A LARGE CITY ?
HO-OH
THINK OF ALL THE INTERACTIONS THAT OCCUR IN IT EVERY SECOND.
AT EVERY OFFICE... FACTORY... SCHOOL...
...AT EACH HOME...
ON THE STREETS... IN THE ELECTRICAL APPLIANCES... AT THE STADIUMS !!!
NOW THINK OF THIS CITY AT THE LEVEL OF A CELL.
HO-OH
WOULD YOU BE ABLE TO ISOLATE FROM IT A TARGET PERSON ?
WHY ME ?
PRETTY DIFFICULT EH...?
HO-OH
WELL... AT A MOLECULAR LEVEL, THE HUMAN BODY IS EVEN LARGER THAN OUR LARGEST CITY AND FINDING A TARGET MOLECULE IN IT IS NOW POSSIBLE THANKS TO CAPILLARY ELECTROPHORESIS.
IN ANOTHER ISSUE OF DOCTOR CHEM, WE WILL LEARN WHAT C.E IS, HOW IT WORKS AND WHAT ITS APPLICATIONS ARE. MEANWHILE.. STAY TOGETHER!
HO-AH
JARAPE.

Of Dr. Chem ®©


WHENEVER YOU HAVE A MIXTURE OF MOLECULES WITH DIFFERENCES IN THEIR ELECTRICAL CHARGES
HO
OH
R
THESE ARE GOOD CANDIDATES FOR SEPARATION BY THE APPLICATION OF AN ELECTRICAL FIELD TO THE MEDIUM.
THIS FIELD MOVES MOLECULES IN SUCH A WAY THAT IT GENERATES A MOTION OF THE FLUID.
THE SO CALLED ELECTROOSMOTIC FLOW!
IF THE FLUID IS A BUFFER IT CAN ELECTROOSMOTICALLY FLOW THROUGH A CAPILLARY TUBE
EASY, MAN, EASY!
WHAT YOU HAVE THEN IS A POWERFUL SEPARATION TECHNIQUE CALLED . . . CAPILLARY ELECTROPHORESIS (CE)
WE ARE FREE!!!!
CAN YOU FIGURE OUT HOW CE CAN SEPARATE MOLECULES ELECTRICALLY NEUTRAL?
HO
OH
R
CAN YOU TELL WHEN TO USE HPLC AND WHEN CE?
HO
OH
R
JARAPE.
FOR FURTHER READING SEE:
-BLANC, T; SCHAUFELBERGER, D; N. GUZMAN. CAPILLARY ELECTROPHORESIS. ANALYTICAL INSTRUMENTATION HANDBOOK. 2ND ED. GALEN WOOD EWING. USA.

by Rosendo Garcia
and Roxie Allen

Biennial Presentation Highlights

Here are some of the titles of the almost 40 workshops planned for the conference. Pick your favorites and make plans. There will be plenary sessions for all us also. Don't forget the field trips too. We also tend to get together informally in the evenings and play games (while exchanging ideas on chemistry, of course). We have some talented people who play well and others who make great teams. Bonding and Chemistry – Chemistry and Bonding. Don't miss it and we'll see you in Galveston!

ChemApps: Web Applets and Visualizations in Chemistry Teaching
My Favorite Labs
Making Chemistry Logical and Relevant
Beginning TI Calculator Use
Advanced TI and CBL Use
An Alternative Presentation of "A Walking Tour of the Elements"
Chemistry through Crafting
Make-N-Take
Mean Green Demos
Inject a Syringe in your Chemistry
Make the Invisible...Visible in your Chemistry Class - Probeware
Open-ended Lessons in Chemistry? Not in MY Lab!
Colorful Chemistry
Analogies in Atomic Structure and Other "Difficult" Phenomena
Preparing Students for Collegiate Chemistry Laboratories via the Web
Future Trends in Nuclear Chemistry and Radiochemistry
Memories of Glenn Seaborg
University of Houston presents: Welch Summer Scholars 2003
Tricks of the Trade...AP Chemistry Strategies
Second Semester Stuff!
Out of Thin Air
Using the CBL2 and LabPro to Investigate Intermolecular Forces
TI-83 Plus/CBL 2 Determination of the Vapor Pressure of Water
Nuclear Chemistry is Explosive!
A Visual Acrostic
Periodic Table Simulation
Reactions, AP Style
The UT Homework Service: A 21st Century Online Science Ed Resource
Brio Refining Superfund Site
Millionaire and Jeopardy: Review Games Gone Wild!
Reading and Grading the 2003 AP Chemistry Exam
Overview of the *Lighthouse Document* for Science
General Equilibrium and Ksp Techniques

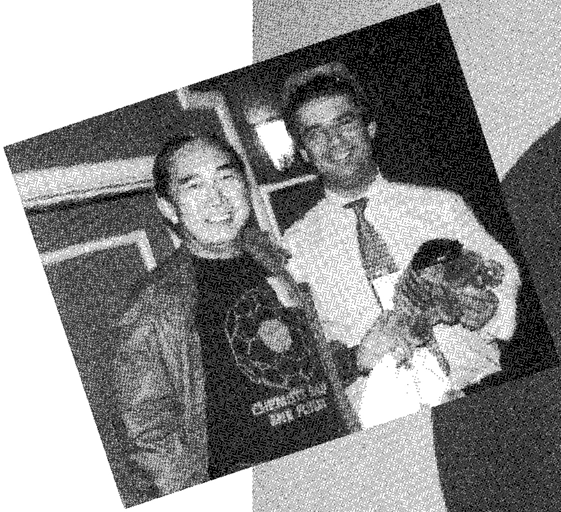
Join us this summer for the
Eighth Biennial ACT_2 - Welch Conference

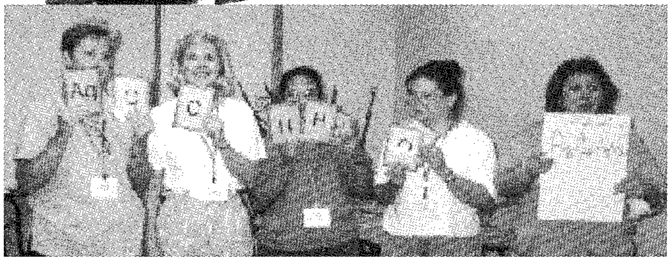
Chemistry By The Sea

Tuesday, July 8, 2003
to
Saturday, July 12, 2003

Texas A & M - Galveston

Register online at
www.statweb.org/act2
or
mail forms
starting p. 12





by
Ken Lyle
Purdue University

Chemical Demos as Assessment Tools

Chemical demonstrations continue to be a valuable instructional methodology employed by teachers to illustrate chemical phenomena and principles; stimulate inquiry; model proper, safe handling of equipment and materials; address misconceptions; stimulate classroom discussions; and create a fun exciting classroom atmosphere. Demonstrations can also be used as an alternative method to assess student understanding.

Assessment involves the collection of data to make an informed evaluation of, or judgment about an aspect, or aspects of an instructional program. An *assessment tool* is a device, or means to collect and record data of interest. Chemical demonstrations used as assessment tools can provide the teacher with valuable information about the students' current level of understanding of the science involved and their abilities to apply this understanding to novel situations.

Deese, W. C., Ramsey, L. L., Walczyk, J., & Eddy, D., (1) describe an assessment strategy involving the use of chemical demonstrations as an assessment tool. The method described by the authors involves:

- Passing out general rubrics to the students prior to the demonstration
- The demonstration is then performed.
- The students then record their observations and write their explanation for what they observed.
- After the papers have been collected, an actual task-specific rubric is passed out to the students and used to facilitate discussion.

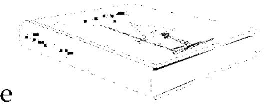
The general rubric, Table 1, provides information to the students about what is to be expected of them and how their work will be scored. This helps the students focus on the task at hand.

Table 1: General Scoring Rubric

Score	Accomplishment
0	Make no observations or inaccurate observations.
1 - 6	Makes accurate observations but no accurate inferences.
7 - 12	Makes accurate observations, uses some appropriate vocabulary to draw some accurate inferences.
13 - 20	Makes accurate observations and accurate inferences, cites evidence, uses appropriate vocabulary.

Students observing the demonstration, writing about what they observed, and explaining why actively engages them in applying science concepts in a unique situation. The papers, the task-specific rubric, and the subsequent discussion provides both students and teachers with immediate feedback on student learning. The task-specific rubric also exposes students to models of expert thinking. Use of this method encourages learning through multiple modalities and accomplishes multiple objectives.

I will use the *Freeze Board* (2) demonstration to illustrate a task-specific rubric. In the demonstration a few drops of water are placed on a wooden board and a small empty beaker placed on top of the pool of water. Approximately a teaspoon each of solid barium hydroxide octahyrdrate and solid ammonia chloride are combined in the beaker and stirred for a few moments. The mixture becomes fluid and a strong odor of ammonia can be detected. In a few moments the beaker is frozen to the board. When the beaker is raised the wooden board is raised with it. A possible task-specific rubric for this demonstration, Table 2, is shown on the next page.



This rubric suggests that the demonstration assessment followed units that covered classes of reactions, exothermic and endothermic processes, and chemical thermodynamics.

Deese, et al. (1) have found the use of chemical demonstrations as assessment tools following this methodology has led to improved student performance on exams and overall course grades for their general chemistry college course.

I feel that this method of assessment is worthy of consideration and encourage each of you to give a try. For more information about this assessment method see the Deese, et al. article (1).

References:
1. Deese, W. C., Ramsey, L. L., Walczyk, J., & Eddy, D. (2000). Using demonstration assessments to improve learning. *Journal of Chemical Education* 77(11), 1511-1516.
2. Shakhashiri, B. (1983), Chemical Demonstrations, Vol. 1, pp 10-12. Madison, WI: University of Wisconsin Press

Assessment (cont)

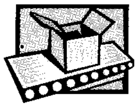
Table 2: Task-Specific Rubric for the Freeze Board Demonstraton

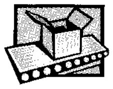
Score	Accomplishment
0	Makes no observation or inaccurate observations.
1 - 6	*Observations:* Equal amounts (volumes) of two different solids (barium hydroxide octahydrate and ammonium chloride) were combined in a small beaker that was placed on a piece of wood that had been wetted with a few drops of water. The mixture of solids became more liquid as it was stirred. An odor of ammonia was noted. The outside of the beaker felt cold. After a while, the beaker was raised; the board was stuck to the bottom of the beaker. The material in the beaker at the end of the demonstration was milky-white and fluid.
7 - 12	*Explanation:* A chemical reaction occurred between the two solids indicated by the formation of a gas and a liquid. The reaction was endothermic, absorbing energy from the surroundings, causing the water between the beaker and the board to freeze.
13 - 20	The products of the reaction were ammonia gas (ammonia odor), water (the liquid), and barium chloride (the milky white substance). The reaction is a double displacement reaction (metathesis) followed by the decomposition of the ammonium hydroxide formed. $Ba(OH)_2 \bullet 8H_2O(s) + 2\ NH_4Cl(s)$ --> $BaCl_2$(sat.) + $2\ NH_3(g) + 10\ H_2O(l)$ Energy is absorbed from the surroundings as the reactants are converted into products. The change in enthalpy for the reaction, ΔH, is greater than zero; the products have more enthalpy (stored chemical energy) than the original reactants. This spontaneous reaction is entropy driven, $\Delta S>0$, due to the increase in the number of particles and a change of physical state from solids to a gas, a liquid, and a solution.

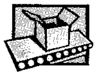
Mole Box

by
Rosendo García &
Shelley Abernathy

We all know that a mole of a gas at STP occupies 22.4 liters of space. A box of the right size is a cube that is 28.2 cm on a side. Make a box or several and label them. Leave them on a shelf and they will be there when you need them. Students will see them and wonder about them all semester long!







Big Board Game

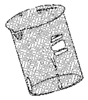
by Jane Gray &
Amiee Modic

We developed an easy review game that plays like many board game. We made a huge game board using butcher paper and we roll it out on the classroom floor. We got some big plastic dice that the students toss to play the game. Grab some lab equipment like a test tube rack, a graduated cylinder, a beaker, or anything else to use as game pieces and you are almost ready to go. All that is left is to set-up the questions. We write the questions on numbered index cards that correspond to the numbers on the game board. Some questions require pictures or data and must also be put together. Below are the rules we use. That's it. You are set to go!

Materials

game board
die for each team
playing piece for each team
numbered index cards with written questions
"Exhibit" Cards with pictures and data

Playing Directions

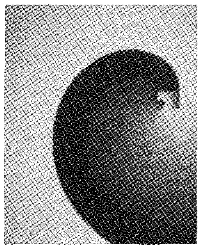


1. Divide the class into 4 (or 5) teams.
2. Have each team roll a die to see which team goes first.
3. Start the game with the first team and then play clockwise.
4. Ask each team a very easy question to start the game (such as, What six weeks are we in? Who is the head principal of the high school? or What sports are competing this week?)
5. Let each team role the die as soon as they answer a question correctly and move their playing piece that number of spaces.
6. After the first round of "easy" questions, begin asking previously written and numbered questions (from the chapter or content area) that corresponds with the number on the game board.

   Read each question only once. That way all teams must listen to the question. They can record either the question or the answer so they don't forget.

   Some questions will refer to exhibit cards that show a diagram with data.

7. The team must come to a consensus and have a spokesperson give the answer. The correct answer will result in the roll of the die and move of the playing piece. Have one person per team be in charge of moving the playing piece. They can also contribute to the team when coming up with an answer.
8. If the team misses the same question twice, give them an alternate question.
9. The first team to roll enough on their die to enter the last box wins.



Chemistry By The Sea

ACT$_2$-Welch Biennial Conference
Texas A & M Galveston
July 8-12, 2003
Registration Form

Registration Fee: $100 (by June 1) or $125 (on site) = ________
Please Print Clearly

Name: ______________________________ E-mail: ____________________
Last First

Street Address: ____

City, State Zip: ____

Phone (please include area code): ____________________

All plenary sessions, Tuesday evening buffet, concurrent sessions, use of recreational facilities, snacks and on-site activities are included in the registration fee. Field trips, accommodations, and meals are extra. Please see the following page for field trip information.

Dorm Accommodations with Meals:

Cost covers nightly accommodations and full day of meals the subsequent day, except Friday as noted below. The closing banquet is Friday night. If you stay in the dorm, you must pay for full meals. A list of hotels in the area will be available on the web at www.statweb.org/act2/.

Please mark nights needed:

☐ Tues. ☐ Wed. ☐ Thurs.

Double Occupancy with meals following day $31/night/person x nights = ______

☐ Friday night Double Occupancy with Sat AM breakfast. $18/person = ______

In order to assign roommates please mark your gender: ☐ Male ☐ Female

Roommate 's Name: ______________________________

If no roommate preference is given one will be assigned. Please note that there are a limited number of dorm rooms so only double occupancy is available unless there are extenuating circumstances. The majority of rooms are suite style with two single beds in each room. No linens are provided. Check out time is at 11:00am on Saturday.

Meals on campus (if not staying in the dorm):

Please mark days needed:

☐ Wed. ☐ Thurs. ☐ Fri. (includes banquet) $18/day x days = ______

☐ Friday night banquet only $7/person x #people = ______

Field Trips:

(Subject to change. Please see the web page at www.statweb.org/act2/ for up to date information. Transportation is included in the cost of the field trip.)

☐ Wed. July 9th, afternoon: NASA "badge tour" $10/person ________

Participants MUST be registered by May 15th to allow for background checks. This is a site tour of the Johnson Space Center focusing on, but not limited to, chemistry in space. Due to security pre-registration is required. At print time, this field trip is still tentative. Fee will be refunded if we are unable to take this tour. (Limited to 25 participants)
http://www1.msfc.nasa.gov/NEWSROOM/background/facts/eclss.pdf

☐ Wed. July 9th, evening: Ocean Star Drilling Platform ____$Free__

Enjoy dessert and coffee and a private after-hours tour of this retired jack-up drilling rig. The museum features three floors of models and interactive displays illustrating the story of offshore oil and gas exploration and production. Scale models of production platforms, actual drill bits and remotely-operated vehicles (ROVs) as well as videos and exhibits explain drilling, geology, seismic, well servicing and production. Please check if you plan to attend so we may have accurate numbers for transportation and the program. http://www.galveston.com/museums/oceanstar.shtml

☐ Thursday, July 10th, afternoon: Moody Gardens $15/person ________

A behind the scenes tour with the specialists who care for Moody Gardens aquariums and their inhabitants followed by an unguided tour of the Aquarium. (Limited to 20 participants)
http://www.galveston.com/moodygardens/aquarium.shtml

☐ Thurs. July 10th: Fisherman's Wharf Dinner $29/person ________

Hailed by *Texas Monthly* as the premiere restaurant of the Texas Gulf Coast, this Texas-sized establishment is waterfront dining at its best. Ideally situated next to the Historic Strand District, it's dining rooms boast of a splendid view of the harbor. Cash bar available. Return transportation will be staggered so that participants can wander The Strand if desired.

☐ Fri. July 11th, morning: Harbor Boat Tour/Elissa Tour $20/person ________

Board the SeaGull and view Galveston from the sea. You will learn some of the remarkable history of this port city and seine the harbor floor under the expert direction of a marine biologist. Then disembark the SeaGull and step back in history as you board the sailing ship ELISSA. Explore the decks of this floating National Historic Landmark that has also been designated one of America's treasures by the National Trust for Historic Preservation. In the adjacent museum and theater, witness the story of the ELISSA's dramatic rescue from the scrap yard and her meticulous restoration.
http://www.portofgalveston.com/about/history.html and http://www.galveston.com/museums/seaport.shtml

☐ Sat. July 12th, morning: Birding & Water Testing Boat Tour $17/person ______

Cruise to West Galveston Bay on the Texas A&M vessel, Earl Milan, to see the North Deer Island rookery. Brown Pelican, Great Blue Heron and Great Egret chicks should be ready for fledging. White Ibis nest on this island numbering in the thousands. On the return trip, we will stop in the Galveston Ship Channel and do some water chemistry. We will also deploy instruments and monitors similar to those used by chemical and biological oceanographers. (Limited to 20 participants)

ACT_2 Dues ($10/year if not current) dues ___________

☐ Two years (preferred) ☐ One year

T-shirt Size (One free with registration, additional ones, $8) t-shirts ___________

☐ S ☐ M ☐ L ☐ XL ☐ 2XL ☐ 3XL

☐ S ☐ M ☐ L ☐ XL ☐ 2XL ☐ 3XL

Beach Towel ($8 each or can substitute for T-shirt) towel ___________

☐ # Towels ___________ ☐ Substitute for T-shirt

☐ Need CPE credit certificate

☐ Will bring items for the silent auction (science stuff, fun stuff, silly stuff!)

TOTAL ***(Make checks payable to ACT_2)*** total ___________

This form and payment must be postmarked by June 1, 2003 for pre-registration. A confirmation e-mail will be sent after payment is received. There are a limited number of scholarships raised by the silent auction at the 2001 conference available to defray registration fees. If you would like to be considered for one, please complete the form as soon as possible and submit it with payment for everything except registration. Grant decisions will be made on May 1st, based on forms received at that time. You will be notified if you are awarded a scholarship or not so that you can complete registration. Preference for the scholarship will be given first to teachers attending the conference for the first time, followed by teachers traveling the farthest distance, then those willing to present a workshop.

☐ Consider me for a scholarship.
Please attach a paragraph stating why you should be awarded a scholarship.

Return forms with payment to:

Jane Gray
2410 Old Dixie Rd
Richmond, TX 77469

If you have any questions regarding the Biennial ACT_2-Welch Conference contact Roxie Allen.
Home phone: 281-225-6986 Cell phone: 713-419-5118
School phone: 713-850-0222 ext 334 E-mail: rkvallen@yahoo.com

ASSOCIATED CHEMISTRY TEACHERS OF TEXAS

MEMBERSHIP APPLICATION

(Current members should use this form to update information)

SOCIAL SECURITY NUMBER ____________________ DATE ____________

NAME ____
Last First MI

E-MAIL ADDRESS ______________________________

SCHOOL DISTRICT ____________________ I. S. D. ESC REGION ________

SCHOOL NAME ______________________________ STAT MEMBER ☐ YES ☐ NO

HOME ADDRESS *(where mail can be sent even during the summer)*

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Street City State Zip

PHONE NUMBERS *(include area codes)*

( ) ______________ ( ) ______________ ( ) ______________
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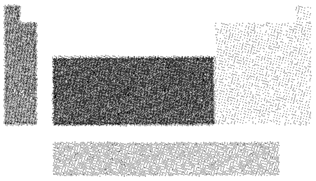
REACTANT INFO: (Check how you would like to receive the newsletter.)

☐ ELECTRONIC COPY VIA INTERNET ☐ HARD COPY VIA US MAIL

JOB DESCRIPTIONS: (Check all that apply)



☐ TEACHER
☐ DEPARTMENT HEAD
☐ PRINCIPAL
☐ SUPERVISOR
☐ OTHER ______________________

☐ HIGH SCHOOL
☐ TWO-YEAR COLLEGE
☐ UNIVERSITY
☐ OTHER ______________________

DUES: (Check all that apply)

$20.00 ☐ TWO YEAR MEMBER, ACT_2 (PREFERRED)
$10.00 ☐ ONE YEAR MEMBER, ACT_2

TOTAL PAID $ ________

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Please Do Not Delay

Use Application form (p. 15) to update your membership information.

If your Dues Date is highlighted, this is your last issue!!